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ABSTRACT

This annotated bibliography cites sources dealing with two problems: (1) deciding which curricula should be developed; and (2) developing curricula efficiently. The sources cited were selected on the basis of availability, applicability to automated technologies, currency, comprehensiveness, practical usefulness, and generalizability. Following an alphabetical index to the materials by topic, citations and annotations are provided for 36 documents, covering the years 1974 through 1984. (AYC)

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DECISION MAKING SYSTEMS AND DATA SOURCES FOR TECHNICAL EDUCATIONS IN COMMUNITY COLLEGES/TECHNICAL INSTITUTES

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Decision Making Systems and Data Sources

for

Technical Educations in Community Colleges/Technical Institutes

by

Charles R. Doty and Carolyn DeCastro*

Two of the persistent problems facing community college administrators are: 1) how to decide which curriculum should be developed and 2) how to efficiently develop curriculum. A search of the literature yielded several sources which could be of use to solve these two problems. These sources have been selected upon the following criteria:

The sources available.

The sources apply to automated technologies.

The sources, for data, are the most recent and most comprehensive.

The sources, for curriculum development, are practical guides.

The sources have a generalizability that is national in scope.

To present the information conveniently, an alphabetical listing of the topics is given with a list of references for each topic. The listing is followed by abstracts of the references in alphabetical order.

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Automation technologies

Computerized manufacturing automation.
Micro-electronics, robotics and jobs.
Office of Technology Assessment
Todd

CAD/CAM programs

Abram, et al.
Jaffee, et al.
New technology

Changing occupations

AF of L & CIO
Automation and the workplace
Beilby & Corwin
Computerized manufacturing automation
Jaffee, et al.
Job forecasting
Long
Maxwell & Nunes
Micro-electronics, robotics and jobs
New technology
Office of Technology Assessment
Russel
Technology, assessment ...

College marketing

Corey, et al.
Groff (1983)

Computer applications

Abram, Ashley, etc.
Faddis, et al.

Computer literacy

Corey, et al.
Groff (1983)

Conservation technicians

Corey, et al.

Curriculum development

Ashley, et al.
Beilby and Corwin
Hedlund, et al.
Maxwell & Nunes
Russell
Todd

Declining enrollments

Arns

Declining student abilities

Corey, et al.

Electronic delivery of programs & services

Groff (1983)

Electronic processing technician

Mahallis and Fair

Energy technologies

Jaffe, et al.

Human resource development

Groff (1980 - 1983)
Todd

Information processing

Groff (1983)

Information technology

Corey, et al.

Job markets-future

Arns
Beilby & Corwin
Computerized manufacturing automation
Hedlund, et al.
Hunt & Hunt

Job markets-future

Job forecasting
Long
Maxwell & Nunes
New technology
Office of Technology Assessment
Russel
Technology, assessment ...

Labor force statistics

AF of L & CIO
Job forecasting
Long
New technology
Office of Technology Assessment

Laser technicians

Corey, et al.

Lightwave circuit technology

Groff (1983)

Long range planning

Abram, et al.
Computerized manufacturing automation
Hunt & Hunt
Job forecasting
Long
Long and Warmbrod
New technology
Office of Technology Assessment
Technology, assessment ...

Machine tool design

Groff (1983)

Manufacturing technologies

Abram, Ashley, etc.
Computerized manufacturing automation
Faddis, et al.
Groff (1983)
Micro-electronics, robotics and jobs
New technologies
Office of Technology Assessment

Mathematics and science

Corey, et al.

Medical technologies

Abram, Ashley, etc.

Microelectronics

Groff (1983)
Jaffe, et al.
Micro-electronics, robotics and jobs (for international perspective)

National Postsecondary Alliance

Long

Needs assessment (State wide)

Aton, et al.
Reed
Russel

New Partnerships

Arns
Warmbrod, et al.

Occupational analysis

Mahallis and Fair
Maxwell & Nunes

Office technologies

Abram, Ashley, etc.

Optical data transmission

Jaffe, et al.

Preparing for high technology

Abram, et al.
Beilby & Corwin
Computerized manufacturing automation
Groff (1980)
Job forecasting

Preparing for high technology

Long
Long and Warmbrod
New technologies
Office of Technology Assessment
Russel
Technology, assessment ...

Process control

Jaffe, et al.

Program developing

Abram, et al.
Ashley, et al.
Beilby & Corwin
Hedlund, et al.
Long and Warmbrod
Maxwell & Nunes
Russel

Program evaluating

Abram, et al.
Beilby & Corwin
Guidelines for occ. program assessment
Hedlund, et al.
Russel

Program implementing

Abram, et al.
Beilby & Corwin
Hedlund, et al.
Long and Warmbrod
Maxwell & Nunes

Program planning

Abram, et al.
Ashley, et al.
Beilby & Corwin
Hedlund, et al.
Long
Long and Warmbrod
Maxwell & Nunes
Office Technology Assessment
Russel

Robotics

Abram, et al.
AF of L & CIO
Ashley, et, al.
Computerized manufacturing automation
Corey, et al.
Faddis, et al.
Groff (1983)
Hunt and Hunt
Jaffe, et al.
Micro-electronics, robotics and jobs
New Technologies
Office of Technology Assessment

Software development

Jaffe, et al.

Software evaluation

Chase, et al.
Stone

Telecommunications

Corey, et al.
Faddis, et al.
Technology, assessment ...

Unemployment trends

AF of L & CIO

Abram, R., et al. Preparing for high technology: CAD/CAM programs. Research and Development Series No. 234. Columbus, Ohio: National Center for Research in Vocational Education, 1983. (ED228473, also see ED 216167-169 and CE 035620-621)

This guide is one of three developed to provide information and resources to assist in planning and developing postsecondary technican training programs in high technology areas. It is specifically intended for the initial stages of planning a specialized training option in computer-aided design (CAD) and/or computer-aided manufacturing (CAM). (Two companion guides offer generalizable procedures for program development in high technology and curricular information for planning a robotics training program.) Information is presented on industry trends, CAD curricular requirements, and training implecations of CAD technology. Emphases is given to a listing of CAD drafting competencies and a detailed course outline of teaching topics that is oriented toward mechanical and product applications. Part 3 overviews CAM. The general and specific skill requirements of CAM users are addressed, and training guidelines are offered. A basic curriculum for CAM instruction is presented. Current and long-range market trends for CAM are described. Appendixes include an overview of CAD from the user's perspective, training considerations for users of CAD systems, and a survey of Application CAD system users.

Abram, R., Ashley, W., Faddis, C., and Wiant, A. Preparing for high technology: programs that work, book 1. Columbus, Ohio: National Center for Research in Vocational Education, 1982. (ED216167)

Ten case studies describing cooperative arrangements between colleges and industries developing and using high technology are presented. The role of each in planning, designing and implementing technician training programs is described. Case studies focus on advanced computer applications, microelectronics, medical technologies, advanced manufacturing and advanced office technologies. Attention is directed to program planning, funding, staff recruitment and training, curriculum development and revision. Specific recommendations are offered for postsecondary institutions, for state and local agencies and for business and industry.

Abram, R., et al. Preparing for high technology: 30 steps to implementation. Columbus, Ohio: National Center for Research in Vocational Education, 1983. (ED 228 471)

This is one of three planning documents that focuses on technician-level training needs in high-technology fields. (The other two documents address robotics, i.e. (ED 228 472) and CAD/CAM programs (ED 228 473). Directed toward postsecondary administrators and planners, the guide presents a thirty step planning process that is applicable to a wide variety of high-technology training areas. The contents are divided into three parts: the first part presents an overview of the project and outlines the problmes, objectives, methods and outcomes; part two is directed toward preplanning for long range planning. Included are fourteen questions that are important before setting up advisory committees and implementing a high-tech program; part three presents the thirty steps which are divided into five activity categories (long range planning, program planning, development, implementation, and evaluation). A summary of do's and don'ts is included. An explanation of the DACUM method (Developing a Curriculum is presented in the appendix.

American Federation of Labor and Congress of Industrial Organizations. The Future of Work. A Report by the AFL- CIO Committee on the Evolution of Work. Washington, DC: AFL and CIO, in 1983. (ED 233 137)

The surplus of labor in the U.S. is having a significant impact on all segments of the population; young and old, black and white, blue collar and white collar. Attention in this report is directed to the threat this surplus is having on the stability of the economic, social and political institutions of the United States. Unless there is a concerted effort to expand job opportunities and to change economic conditions, this labor surplus along with its negative impact will continue into the 1990s. The recommendations developed by the AFL-CIO to reduce the surplus are outlined. Many tables and graphs highlighting unemployment trends, labor force statistics, changing occupations, the influence of robotics and the influence of the balance of trade are included.

Arns, K. F. (Ed.) Occupational Education Today. New Directions for Community Colleges, Number 33. Los Angeles, California: ERIC Clearinghouse for Junior Colleges, 1981. (ED 200 286)

This document contains eleven essays that examine issues facing community college educators. In the section entitled "Editor's Notes," Kathleen P. Arns synthesizes four major issues in the book: declining enrollments, future job markets, the changing economic climate and new partnerships. Each essayist then focuses on a specific topic. Chapter titles and authors include: 1) Changing Form and Focus of Occupational Education (John Gredé); 2) Challenges Facing Community Colleges in the 1980s (Andrew Korim); 3) Occupational Education in Community Colleges in the 1980s (Lawrence Davenport); 4) Articulating with Industry in Economic Development (David Bushnell); 5) Can Vocational Graduates Find Jobs? (R. Dan Waller and Betty Pritchett); 6) Increasing College Responsiveness to Community Needs (J. Stanley Spanbauer); 7) Program Reassessment, Reduction and Redirection (James E. Seitz); 8) Survival in a Different Future (John E. Cleek); 9) The Marriage of the Humanities and the Trades (William A. Koehline); 10) Imaginative Programs - A Military/Civilian Partnership (Douglas E. Testerman); and, 11) Sources and Information Issues in Occupational Education (Donna Dzierlenga).

Ashley, W., et al. Preparing for High Technology: Robotics Programs. Research and Development Series No. 233. Columbus, Ohio. National Center for Research in Vocational Education, 1983. (ED 228 472), also see (ED 216 167-169)

This guide is one of three developed to provide guidelines, information, and resources to plan and develop postsecondary technician training programs in high technology. It is specifically intended for program planners and developers in the initial stages of planning a new program or specialized option in robotics. (Two companion guides offer a set of generalizable procedures for systematic program development in high technology and curricular information for planning a computer-aided design, computer-aided manufacturing training program.) Information is presented on industry trends in robotic technology, current projects in industry and education, and the need for training. Curriculum planning guidelines and specifications are also given. Lists of technician-level competencies and sample course titles and course descriptions are provided. Other factors that must be considered in developing and implementing a new program are discussed, including special training for application processes, equipment requirements, faculty capabilities, and future trends. Appendixes include a list of robot manufacturers and postsecondary programs, a bibliography of robotic technical papers, and a paper on robotics training.

Aton, C. L., et al. An Advanced Technology Study for Post-Secondary Area Vocational-Technical Schools. Final Report. Atlanta, Georgia: Georgia Institute of Technology, 1982. (ED 223 789)

This report is of a Georgia study conducted to determine the State's current and future vocational-technical training needs in advanced technology. Section I reviews the purpose of the study. Section II identifies current trends and their impact on technician training during the next two decades. The third section identifies weaknesses in the skill-levels of graduates and elements lacking in current porgram offerings. Section IV analyzes Georgia's present vo-tech system with regard to perceived barriers and changes needed to meet high-tech training needs. The next section presents problems in common with eight other states (educational structure, program offerings, teacher update, industry/schools interface, teacher salaries, vo-tech image, the economy). The final section offers recommendations.

Automation and the Workplace. Selected Labor, Education and Training Issues. A technical memorandum. Washington, DC: Office of Technology Assessment, 1983. (ED 230 701).

This technical memorandum discusses procedures for evaluating potential employment change associated with automation and outlines associated problems. It also describes the nature and modes of delivery of education, training, and retraining for persons holding or seeking employment in manufacturing industries. An introduction provides a brief review of the evolution of programmable automation and sets out several factors that influence the social and economic consequences of new technologies. Chapter 2 discusses methodology and provides background material useful for evaluating employment and working environment changes. Shortcomings of many publicized employment forecasts and requirements for satisfactory forecasts are pointed out. Chapter 3 examines the changing role of education, training, and retraining; describes how industry and labor engage in instructional services delivery; presents current views of representatives of the industry, labor, and educational community concerning changes in instructional requirements and providers; and outlines critical issues for those engaged in instructional design and delivery, in light of possible widespread use of programmable automation. Appendixes include the methodology of a survey to identify education and training requirements inherent in the use of programmable automation, a paper on industrial relations, and six papers presented at a workshop on the analysis of labor markets and industrial relations.

Beilby, A. E. and Corwin, L. Curriculum Decision Making in Occupational Education: A Procedural Checklist and Guide. Research publication 76-5. Ithaca, New York: Cornell Institute for Research and Development in Occupational Education, 1976. (ED 130 728).

The reviewers agree with the authors of this guide, i.e. "Reading this will save time." This is a comprehensive guide to developing curriculum which was based on the prior work by Hedlund, D. E., et al. (ED 099 042). This guide contains checklists (questions) for seven crucial areas, programs identity articulation, resources, students, employment, support, and evaluation.

Chase, Shirley A., Gordon, Ruth; and Makin, Richard. Courseware Evaluation: Form and Guide for Vocational and Technical Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1984. (ED 244 058).

This microcomputer courseware evaluation form and guide are intended for vocational and technical educators who determine the quality of courseware, professional reviewers who conduct and publish reviews of courseware, and developers who seek to produce high quality courseware for vocational and technical education. The guide includes a brief description and explanation of the evaluation form, a glossary of terms, a suggested procedure for using the evaluation system, and brief explanation of every item in the actual courseware evaluation form. The courseware evaluation form contains three parts: descriptive information about the courseware, courseware evaluative criteria, and a summary rating.

Computerized Manufacturing Automation: Employment, Education, and the Workplace. Washington, DC: US Congress, Office of Technology Assessment, OTA-CIT-235, April 1984.

The most comprehensive report reviewed is this document. It describes the technologies of programmable automation, their uses, and future capabilities. The assessment these technologies includes descriptions of the industries producing and using programmable automation and an analysis of potential change in the industrial structure and competitive process. The report is documented with national and internal labor statistics and conceptual charts of occupational demand and change. In addition to this wealth of information, 18 case studies, including 4 on the work environment and 14 on education and training programs, and a survey of education and training activities are included.

Note: It is the opinion of the reviewers of this report that any educator in a planning capacity should examine this report.

Corey, D., et al. What's on the horizon? Trends impacting higher education. Warren, Michigan: Macom County Community College, 1983. (ED 231270)

This paper investigates several trends impacting the future of higher education. Described are demographic changes including the aging of the baby boom, the north-south population shift and enrollment decreases in postsecondary institutions. Six factors affecting curriculum changes are explored: 1) information technology; 2) literacy decline; 3) mathematics and science; 4) language; 5) lifelong learning; and, 6) the human potentail movement. The responsibility of community colleges to find solutions for declining student abilities is emphasized. A section on career projections focuses on computers, telecommunications, robotics and other technologies (i.e. laser technicians, conservation technicians and hazardous waste technicians). Changes in community college funding and the need for marketing and strategic planning are also discussed.

Paddis, C. et al. Preparing for high technology: strategies for change. Columbus, Ohio: National Center for Research in Vocational Education, 1982. (ED 215 168)

The purpose of this report is to inform postsecondary technical colleges of changing technologies and to provide guidelines on how they can meet the new training demands.Three technological innovations are reviewed: tele-communications, computer applications, and advanced manufacturing (including robotics). Each review includes an overview of the technology, new users, changes in labor demand, changes in occupation, job content, skill and skill level and a summary. Factors that inhibit colleges from responding quickly to the high tech training needs of business and industry are outlined as are strategies for rapid response. Categories of resources engaged in research, promotion or information dissemination of advanced technologies are listed including professional associations, university based R&D organizations, research projects.

Groff, W. H. Assisting a college's service area in the transition to the new technology society through strategic planning and management. Ohio: North Central Technical College, 1983. (ED 231453)

This report examines North Central Technical College's strategic planning and development model designed to help the college respond to the technological training needs in its service area. Included is background information about the planning process and description of three strategic goal areas: 1) information processing; 2) electronic delivery of educational programs and services; and, 3) high technology (advanced machine tool design, microelectronics, robotics, and lightwave circuit technology). The college's community renewal projects are described including its Community Education Service's continuing education program and its involvement with the Ohio Technology Transfer Organization, a statewide network providing information, advice and services to small businesses. The appendices include an explanation of three top priorities (human resource development, computer literacy and college marketing) along with outlines of seminars and articulation meetings held for such groups as corporate personnel, high school faculty and area residents.

Groff, W. H. Planning technical education for the eighties. Paper presented at the Annual National Conference on Technical Education, March 27, 1980
(ED 188655)

This paper, presented at the 1980 Annual National Conference on Technical Education, focuses on the technical education environment, the planning function to keep technical education viable and the challenge of leadership. Major societal changes and their impact on higher education are examined. Included are the revolution in education (lifelone learning, equal access) accountability, finite resources and changes in the workplace. A planning process emphasizing the following factors is presented: 1) planning protocol and structure; 2) planning assumptions; 3) goal specification; 4) program development; and, 5) personnel development. Suggestions on the role that colleges and professional associations can play in influencing future policy development are presented. Extensive footnotes list a wide variety of resources.

Guidelines for occupational program assessment. Phoenix, Arizona: Maricopa County Community College District, 1980. (ED 206 358)

These guidelines were developed by the Maricopa Community College District to standardize the process for assessing their vocational education programs. After identifying purposes of the assessment, the roles and responsibilities of the task forces and the sources of instrument creation, twelve categories are outlined: program planning; program advisory committee; curriculum and instruction; student organization; facilities, equipment and safety; cooperative education; guidance and counseling; placement and follow-up; staff qualifications and professional development; evaluation; services to special populations; and, program support. Included in the appendix is the instrument developed to assess vocational programs along with a Data Matrix that identifies the information source for each question and the person who has the responsibility for providing the information. A timeline, Summary Report Format Cover Sheet and a Progressive Profile are also part of the appendices.

Guidelines for obtaining and using data in vocational program planning. Eugene, Oregon: Lane Community College, 1977. (ED 147520, also see ED 147519 and ED 147518).

Three reports were developed by Lane Community College to describe models for the use of vocational data to implement decision making at key points in program planning and curriculum development. The models are explained exceptionally well in these documents and should provide the reader clear insight in the identification of steps necessary for effective vocational program planning.

Hedlund, E. E., et al. A decision system for occupational programs in community colleges. Research publication no. 75-2. Ithaca, New York: Cornell Institute for Research and Development in Occupational Education, 1974. (ED 099042)

This publication contains a description of a system to develop curricula in the community college. The report contains the concepts important to the development of a system, a review of the literature on occupational planning, questions which must be answered to implement a curriculum, and a comprehensive bibliography concerning program development. See Beilby and Corwin (ED 130728) for the final result of this developmental research.

Hunt, H. A. and Hunt, T. L. Human resourse implications of robotics. Kalamazoo, Michigan: Upjohn (W.E.) Institute for Employment Research, 1983

A study examined the job creation and job displacement potential of industrial robots in the United States and specifically, in Michigan, by 1990. To complete an analysis of the impact of robotics on the American labor force, researchers combined data from previous forecasts of future unit and dollar sales projections and from interviews with representatives of prominent corporate users of robots with data from existing economic research. Unlike many other analysts, the designers of this study state that the near-term employment impacts of robots will not be overwhelming by any means but, instead, will be felt gradually and cumulatively through the years in an evolutionary rather than revolutionary process. While states whose economies are particularly dependent upon the auto industry will suffer greater worker displacement than will other states or regions, the designers of this study do not believe that this job displacement will lead to significant job loss among the currently employed. Rather, the impact of unemployment due to the spread of robotics will be felt most by the less experienced, less well-educated part of the labor force. While the spread of robotics will eliminate many semi- or unskilled jobs, it will create many new jobs requiring a significant technical background. Particularly needed will be robotics technicians and graduate engineers.

Jaffe, J. A., Oglesby, E. H. and Drewes, D. W. (Eds.). Technologies of the 80's.: their impact on technical occupations. Releigh, N. C.: Conserva, Inc., 1982. (ED 222771)

This is one of seven reports identifying new and emerging technologies, assessing their impact on vocational-technical education and describing skill/knowledge requirements of each. Chapter one focuses on technology as a process and its relationship to productivity and work. Chapter two includes nine essays on new and emerging technologies written by experts in each field. The topics covered are: process control; microelectronic monitors; computer based design and manufacture; robotics; software development; optical data transmission; automotive service; renewable energy technologies; and, microcomptuers and microprocessors. Chapter three, an annotated bibiography containing sixty references, is designed to serve as a beginning resource for those interested in new and emerging technologies.

Job forecasting: Hearings before the subcommittee on investigations and oversight of the committee on science and technology, U.S. House of Representatives, ninety-eighth congress, first session. Washington, D. C.: Congress of the U.S., 1983 (ED 235 358)

This congressional report contains testimony and prepared statement that focus on the methods of job forecasting. The purpose of the hearings was to determine how accurately jobs of the future can be predicted and to project the skills and training needed for those jobs. Representative organizations participating included: Forecasting International, Ltd.; Xerox; Massachusetts Institute of Technology; National Association of Working Women; Bureau of Labor Statistics; TRW, Inc. and, National Alliance of Business. Some topic titles include: Jobs with a Future; Impact of Information Technology on Employment; How Accurate were Projections of the 1980 Labor Force?

Long, J. P. Industry speaks to two-year colleges about high technology. Columbus, Ohio; National Center for Research in Vocational Education, 1983. (ED 231492).

A summary of twelve major conclusions reached during the National Postsecondary Alliance's 1982-83 series of regional planning meeting on high technology is presented. Representatives from more than forty companies addressed college administrators on future high technology industrial employment needs. Two major questions were addressed: 1) What does your company do using high tech? and 2) What can two year colleges do to prepare students for jobs in companies like yours? A summary of the representatives' opinions and suggestions include: 1) Industry is now training people for high-tech jobs because it is not pleased with the performance of those trained by colleges; 2) Computers are at the core of all high-tech fields; 3) Not everyone will need to know computer programming but keyboarding skills are essential; 4) Programming jobs will increase to nearly 1,000,000/yr. by 1990; 5) Little increase will be seen in pharmaceutical and biomedical technician jobs. The largest increase will be in the professional NOT the paraprofessional field, 6) Robots will become increasingly important; 7) Computers Assisted Drafting (CAD) will revolutionize drafting design and engineering jobs; 8) Semiconductor

industries will create many technical jobs; 9) Colleges must upgrade faculty and equipment in the electronics area; 10) Communications fields will provide many openings for technicians; 11) The aerospace and military are setting trends in developing and using lasers, computers, CAD/CAM and robots; and, 12) Problems are developing in the software industry because of high costs and short lifespan.

Long, J.P. and Warmbrod, C.P. Preparing for high technology: a guide for community colleges. Columbus, Ohio: National Center for Research in Vocational Education, 1982. (ED 216169)

This guide presents strategies and recommendations to help post-secondary institutions respond quickly to the technological training needs of business and industry. Four major topics are covered: program planning; acquiring equipment; staff development and recruitment; and, curricula and delivery systems. The information is based on data gathered during the Technology Adaptation Project which was designed to investigate post-secondary institutions which already had high-tech training linkages with business and industry. A list of the education, business and industry, and research sites visted is included in the appendix.

Maxwell, G.W. and Nunes, L. Handbook for developing competency based curricula for new and emerging occupations. A handbook for California vocational educators. California: San Jose State University, 1980. (ED210518)

This handbook is designed to help persons identify changes in the labor market and to incorporate these changes into their curricula. The major steps in developing competency based curricular are given, i.e., to identify new and emerging occupations, to perform task analysis, and develop competency based instruction.

Mahallis, M.V. and Fair, L.L. Occupational analysis: a basis for curriculum development and evaluation. Fort Lauderdale: Florida: Breward Community College, 1979. (ED 184652)

In order to develop curricula to meet the training needs of area businesses, Broward Community College designed a research project to: 1) identify occupations with the highest need for vocational training programs; 2) determine job-level skills for those occupations; and, 3) identify available resources and make recommendations for new programs/courses. After the research process is described, the results, conclusions and recommendations are presented. Six occupational areas are highlighted: business data processing programmer, construction secretary, engineering drafting, electronic processing technician, head nurse management and insurance secretary. Techniques and questions used to identify job requirements are presented. Findings for each of the six occupations include information about entry-level requirements, target groups, ranking of job tasks, criteria for promotion and recommendations for course offerings. Sample questionnaires, checklists and letters are in the appendices.

Micro-electronics, robotics and jobs. Information computer communications policy series no. 7. Paris, France: Organisation for Economic Cooperation and Development, 1982. (ED 229641)

For information and data on the international level the reader should examine this monograph.

The monograph contains selected papers presented at the Second Special Session on Information Technologies, Productivity and Labour Market Implications, which took place at the Organisation for Economic Cooperation and Development on October 19-21, 1981. An introductory note summarizes significant points from the meeting. Part 1 contains a report that provides an analytical review of the findings and policies of national commission reports from 11 countries in the field of microelectronics-based technologies, with emphasis on productivity and employment. Following the report are selected replies and comments as well as statements by the Business and Industry Advisory Committee and the Trade Union Advisory Committee. The four papers in part 2 give an overview of the socioeconomic importance of the increasing application in manufacturing of microelectronics-supported machinery. Specific topics are trends in the production and use of industrial robots in West Germany; the promotion of robotics, computer-aided manufacturing in Sweden; robotization in Japanese industries; and the economic and social problems and effects of the change to robots.

New technology in the American workplace. Hearings before the subcommittee on labor standards of the committee on education and labor, house of representatives, ninety-seventh congress, second session. Washington, D.C.: Committee on Education and Labor, Congress of the U.S., June 1982. (ED 230708)

This congressional report contains the testimony of representatives from several organizations on the impact of new technology on employment and the workplace. Some of these represented include: International Association of Machinists and Aerospace Workers; Chase Manhattan; GCA Industrial Systems Group; Advanced Office Concepts; and, Working Women Education Fund. Titles of prepared texts show the wide range of topics covered: Cooperation or Conflict, European Experiences with Technological Change and the Workplace; 2) Industrial Work and Automated Manufacturing Technology/Robotics; A Growing Symbiosis; 3) The Second Industrial Revolution: New Technology in the American Workplace; 4) How Far Can You Go? The Integrated CAD/CAM Factory; and, 5) Management Planning for Industrial Robotics.

Office of Technology Assessment. Automation and the Workplace. Selected labor, education, and training issues. A technical memorandum. Washington, D.C.: Congress of the U.S., March 1983. (ED 230701) (Available from: Supt. of Documents, U.S. Government Printing Office, Washington, D.C. 20402 Stock # S/N 052-003-00900-5 $5.50)

This technical memorandum, prepared by the Office of Technology (OTA), assesses employment changes and associated problems resulting from automation. Attention is also directed to the education, training and retraining that is needed by those holding or looking for manufacturing jobs. Chapter one presents and overview of programmable automation technologies with emphasis on the social and economic changes that are occurring. Chapter two analyzes labor market implications of programmable automation and points out some of the weaknesses in many publicized employment forecasts and the requirements for satisfactory projections. The focus in chapter three is on the changing role of education, training and retraining. The views of industrial leaders are presented and critical issues facing instructional designers are outlined. The appendices include: 1) a survey methodology to identify education and training requirements inherent in the use of programmable automation; 2) a paper on Industrial Relations; and, 3) six papers prepared for an OTA workshop analysis of labor markets and industrial relations.

Reed, W. Occupational-technical program need assessment model. Austin, Texas: University of Texas, 1979. (ED 180542)

A two-part, tri-level needs assessment model designed for practicing community/junior college administrators is presented. A discussion of the two parts (existing and new programs) and the three levels (initial evaluation, individual program screening and individual programs) is followed by data requirements and sources of data. Five categories are outlined: manpower demand; manpower supply; student interests; individual economic considerations; and, insititutional economic interests. Evaluation criteria of the data categories are presented as are forms to help administrators tailor the model to their institution. The appendix includes: 1) a literature review of the relationship of information and decision theory to need assessment; 2) Program/DOT Job Inventory Title; 3) Employers' Program Need Survey Questionnaire; 4) Community Survey Questionnaire; 5) Student Interest Survey Questionnaire; 6) Example of Job-Order Accounting Forms; 7) Sample format of Local Supply and Demand Experience Graduate Follow Data; 8) A format of a student cost benefit analysis form; 9) Sample format of State Supply Vs. Demand Projection; and, 10) Program Enrollment Data Forms

Russel, J. F. Implications of New and Changing Occupations for Instructional Development. Columbus, Ohio: National Center for Research in Vocational Education, 1981. (ED 198 260).

This study identifies new and changing occupations nationally and the curriculum development needed at the vocational education level to respond to the changes. A four step process for determining curriculum development need is included: 1) identification of new and changing occupations; 2) collection of information; 3) location of curricula and program offerings; and, 4) evaluation of development needs. Fifteen occupations are described in terms of job duties, education and training, employment outlook, job/setting, advancement opportunities, available programs and implications for curriculum development. Three occupations need curriculum development: catfish farm manager, computer drafting/graphics technician, and speech/language hearing assistant. Three have a partial need for curriculum development: cable TV technician, instrumentation technician, and aviation maintenance technician. Five occupations have to be closely observed because of their potential importance: neurometrics technician, electromyography technician, hydroponic agriculture specialist, fiber optics technician and personnel/labor specialist. One occupation that seems to have adequate curricula is perfusionist. Three needing assistance are locksmith, word processing specialist, and welder. References and resources are listed after each occupation.

Stone, A. Microcomputer Software for Adult Vocational Education: Guidelines for Evaluation. Information series no. 261. Columbus, Ohio: National Center for Research in Vocational Education, 1983. (ED 232 063).

This guide addresses the applicability of microcomputers to adult vocational training and presents guidelines for creating and evaluating software that specifically addresses adult learning needs. The author discusses the appropriateness of microcomputers as educational and prevocational tools. She highlights those qualities that are the computer's special contributions to the learning process, such as individualization, impartiality, and capacity for routing, and then explains how these features can eliminate barriers to adult learning. Categories of educational software follow, illustrating the use of the computer (1) as an instructional medium, through drill and practice, tutorials, and demonstrations; (2) as a modeling device, through games and simulations; and (3) as a special-purpose, general-purpose, or tool-making (i.e., programming and authoring languages) tool. The remainder of the document outlines the guidelines for software development and assessment, divided into five areas: (1) learning objectives and task analysis, (2) appropriate use of technology, (3) pedagogical considerations, (4) management considerations, and (5) necessity, content, and format for accompanying textual material. In concluding, the author notes the lack of available software that meets these guidelines and suggests using general-purpose software, exploring public-domain programs, investing in commercially available open-ended packages, and encouraging corporations to share their training software.

Technology, Assessment and Occupational Education in the Future. Proceedings of a Conference. Chicago, Illinois: April 29, 1979. Washington, DC.: Department of Education, 1980. (ED 204 605)

This document presents the proceedings of a conference on technology and the future as it impacts occupational education. Five speeches were given. Theodore Conant, a technology and information consultant, told why the U. S. is no longer effectively competing with the Japanese and Europeans in international markets. Bert Cowlan, a telecommunications consultant, discussed the impact of telecommunications technologies on the future world of work. Larry Kamm, an operating mechanical engineer and robot inventor, outlined the reasons for the growing shortage of qualified maintenance engineers and the need for better ability/talent evaluation and vocational guidance by educators. Dr. Herbert Gerjuoy, futurologist, presented demographic, economic, job, education and social trends that will shape the future of occupational education. Dr. Michael Hudson, economist and futurist, spoke about the use of technology assessment information in occupational education and suggested how education can solve long term unemployment problems.

Todd, E. S. Impact of the "steel collar" revolution and robotics upon higher education. Paper presented at the Annual Forum of the Association for Institutional Research. Toronto, Canada: 1983. (ED 232 591)

This speech raises several questions about the form undergraduate education should take to prepare students for the future high technology marketplace. Emphasis is placed on designing curricula based on generalizable human, analytical, and technical skills. an examination of historical and economic changes, productivity questions, demographic projections and employment forecasts is presented. Factors affecting the implementation of automation and robots are described in terms of productivity. labor market demand, training, cost of physical capital, cost of human capital and technological trends. Because the new technologies will demand high levels of verbal and mathematical literacy, students must be well-trained in those areas.

Warmbrod, C. P., et al. Sharing resources: postsecondary education and industry cooperation. Research and Development Series No. 203. Columbus, Ohio: National Center for Research in Vocational Education, 1981. (ED 204 532)

This publication contains a descriptive listing of 219 programs that involve the school-industry or sharing concept between postsecondary occupational education and industry. The descriptions provide the user help in establishing a partnership program. The programs are described by type of activity, i.e., apprenticeship training, Comprehensive Employment and Training Act, community wide collaboration, community based education, contract services for industry, cooperative education and field experience, economic development services, faculty "return to industry" programs, program development sharing, and specialized programs. Guidelines for establishing school-industry cooperation are included.

Two other sources might be examined by the reader:

Corporation-School Alliances

Ascher, C. School learning and corporation-school alliances, ERIC/CUE fact sheet number 16. New York, NY: Clearinghouse on Urban Education, 1983. (Clearinghouse on Urban Education, Institute for Urban and Minority Education/Box 40, Teachers College, Columbia University, New York, NY 10027).

McCormick, R. W. Vocational-technical education interface with Ohio's high technology business and industrial sector. Final report. Columbus, Ohio: Ohio State Advisory Council for Vocational education, 1983. (ED 228416)

Zahniser, G., et at. Microcomputers in voc ed: a decision guide. Columbus, Ohio: National Center for Research in Vocation Education, 1983. (ED 232011, also see ED 232012, ED 232013), Chase, S. A., et al. Courseware evaluation: form and guide for vocational and technical education. 1984, and Stone, A. Microcomputer software for adult vocational education: guidelines for evaluation (ED 232063).

The National Center for Research in Vocational Education has produced a series of publications to enable adminstrators and teachers to familiarize themselves with microcomputers. The series includes at this point in time, two publications by Zahniser, et al. which are guides to using microcomputers, one publication by Wonacott and Long concerning updating teachers, a publication by Chase on courseware evaluation, and a set of guidelines for software evaluation by Stone.

ERIC Clearinghouse for Junior Colleges

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